SEQUENCE LISTING

<110> BLAKELY, RANDY D.
      APPARSUNDARAM, SUBRAMANIAM
      FERGUSON, SHAWN

<120> HUMAN AND MOUSE CHOLINE TRANSPORTER cDNA

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<140> 09/911,077
<141> 2001-07-23

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<170> PatentIn Ver. 2.1

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Leu Ile Leu Leu Val Gly Ile Trp Ala Ala Trp Arg Thr Lys Asn Ser
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ggc agc gca gaa gag cgc agc gaa gcc atc ata gtt ggt ggc cga gat     144
Gly Ser Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp
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att ggt tta ttg gtt ggt gga ttt acc atg aca gct acc tgg gtc gga     192
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Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Val Pro Gly Tyr
 65                   70                  75                  80

ggc cta gct tgg gct cag gca cca att gga tat tct ctt agt ctg att     288
Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
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tta ggt ggc ctg ttc ttt gca aaa cct atg cgt tca aag ggg tat gtg     336
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
              100                 105                 110

acc atg tta gac ccg ttt cag caa atc tat gga aaa cgc atg ggc gga     384
Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly
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ctc ctg ttt att cct gca ctg atg gga gaa atg ttc tgg gct gca gca   432
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
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att ttc tct gct ttg gga gcc acc atc agc gtg atc atc gat gtg gat   480
Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145                 150                 155                 160

atg cac att tct gtc atc atc tct gca ctc att gcc act ctg tac aca   528
Met His Ile Ser Val Ile Ile Ser Ala Leu Ile Ala Thr Leu Tyr Thr
                165                 170                 175

ctg gtg gga ggg ctc tat tct gtg gcc tac act gat gtc gtt cag ctc   576
Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
            180                 185                 190

ttt tgc att ttt gta ggg ctg tgg atc agc gtc ccc ttt gca ttg tca   624
Phe Cys Ile Phe Val Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
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cat cct gca gtc gca gac atc ggg ttc act gct gtg cat gcc aaa tac   672
His Pro Ala Val Ala Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
    210                 215                 220

caa aag ccg tgg ctg gga act gtt gac tca tct gaa gtc tac tct tgg   720
Gln Lys Pro Trp Leu Gly Thr Val Asp Ser Ser Glu Val Tyr Ser Trp
225                 230                 235                 240

ctt gat agt ttt ctg ttg ttg atg ctg ggt gga atc cca tgg caa gca   768
Leu Asp Ser Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala
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tac ttt cag agg gtt ctc tct tct tcc tca gcc acc tat gct caa gtg   816
Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val
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ctg tcc ttc ctg gca gct ttc ggg tgc ctg gtg atg gcc atc cca gcc   864
Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Ile Pro Ala
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ata ctc att ggg gcc att gga gca tca aca gac tgg aac cag act gca   912
Ile Leu Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala
    290                 295                 300

tat ggg ctt cca gat ccc aag act aca gaa gag gca gac atg att tta   960
Tyr Gly Leu Pro Asp Pro Lys Thr Thr Glu Glu Ala Asp Met Ile Leu
305                 310                 315                 320

cca att gtt ctg cag tat ctc tgc cct gtg tat att tct ttc ttt ggt  1008
Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
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ctt ggt gca gtt tct gct gct gtt atg tca tca gca gat tct tcc atc  1056
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ttg tca gca agt tcc atg ttt gca cgg aac atc tac cag ctt tcc ttc    1104
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Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr
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gtg ttt gtg ttt gga gca tct gca aca gcc atg gcc ttg ctg acg aaa    1200
Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
385             390             395             400

act gtg tat ggg ctc tgg tac ctc agt tct gac ctt gtt tac atc gtt    1248
Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Val
            405             410             415

atc ttc ccc cag ctg ctt tgt gta ctc ttt gtt aag gga acc aac acc    1296
Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Val Lys Gly Thr Asn Thr
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tat ggg gcc gtg gca ggt tat gtt tct ggc ctc ttc ctg aga ata act    1344
Tyr Gly Ala Val Ala Gly Tyr Val Ser Gly Leu Phe Leu Arg Ile Thr
        435             440             445

gga ggg gag cca tat ctg tat ctt cag ccc ttg atc ttc tac cct ggc    1392
Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
    450             455             460

tat tac cct gat gat aat ggt ata tat aat cag aaa ttt cca ttt aaa    1440
Tyr Tyr Pro Asp Asp Asn Gly Ile Tyr Asn Gln Lys Phe Pro Phe Lys
465             470             475             480

aca ctt gcc atg gtt aca tca ttc tta acc aac att tgc atc tcc tat    1488
Thr Leu Ala Met Val Thr Ser Phe Leu Thr Asn Ile Cys Ile Ser Tyr
            485             490             495

cta gcc aag tat cta ttt gaa agt gga acc ttg cca cct aaa tta gat    1536
Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
        500             505             510

gta ttt gat gct gtt gtt gca aga cac agt gaa gaa aac atg gat aag    1584
Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
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aca att ctt gtc aaa aat gaa aat att aaa tta gat gaa ctt gca ctt    1632
Thr Ile Leu Val Lys Asn Glu Asn Ile Lys Leu Asp Glu Leu Ala Leu
    530             535             540

gtg aag cca cga cag agc atg acc ctc agc tca act ttc acc aat aaa    1680
Val Lys Pro Arg Gln Ser Met Thr Leu Ser Ser Thr Phe Thr Asn Lys
545             550             555             560

gag gcc ttc ctt gat gtt gat tcc agt cca gaa ggg tct ggg act gaa    1728
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Gly Ser Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp
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Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly
     50                  55                  60
Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Val Pro Gly Tyr
 65                  70                  75                  80
Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
                 85                  90                  95
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
             100                 105                 110
Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly
         115                 120                 125
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
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Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145                 150                 155                 160
Met His Ile Ser Val Ile Ile Ser Ala Leu Ile Ala Thr Leu Tyr Thr
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Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
             180                 185                 190
Phe Cys Ile Phe Val Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
         195                 200                 205
His Pro Ala Val Ala Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
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Gln Lys Pro Trp Leu Gly Thr Val Asp Ser Ser Glu Val Tyr Ser Trp
225                 230                 235                 240
Leu Asp Ser Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala
                 245                 250                 255
Tyr Phe Gln Arg Val Leu Ser Ser Ser Ala Thr Tyr Ala Gln Val
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Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Ile Pro Ala
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Ile Leu Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala
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Tyr Gly Leu Pro Asp Pro Lys Thr Thr Glu Glu Ala Asp Met Ile Leu
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Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
                 325                 330                 335
Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile
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Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe
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Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr
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Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
385                 390                 395                 400
Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Val
                405                 410                 415
Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Val Lys Gly Thr Asn Thr
                420                 425                 430
Tyr Gly Ala Val Ala Gly Tyr Val Ser Gly Leu Phe Leu Arg Ile Thr
            435                 440                 445
Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
    450                 455                 460
Tyr Tyr Pro Asp Asp Asn Gly Ile Tyr Asn Gln Lys Phe Pro Phe Lys
465                 470                 475                 480
Thr Leu Ala Met Val Thr Ser Phe Leu Thr Asn Ile Cys Ile Ser Tyr
                485                 490                 495
Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
                500                 505                 510
Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
    515                 520                 525
Thr Ile Leu Val Lys Asn Glu Asn Ile Lys Leu Asp Glu Leu Ala Leu
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Val Lys Pro Arg Gln Ser Met Thr Leu Ser Ser Thr Phe Thr Asn Lys
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ctt ata ttt ctg gtt gga ata tgg gct gca tgg aaa acc aaa aac agc    96
Leu Ile Phe Leu Val Gly Ile Trp Ala Ala Trp Lys Thr Lys Asn Ser
             20                  25                  30

ggc aac cca gaa gag cgc agt gaa gcc atc ata gtc ggg ggc cgt gac   144
Gly Asn Pro Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp
         35                  40                  45

att ggt ttg ttg gtt ggt ggt ttt acc atg aca gcc acc tgg gtt gga   192
Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly
     50                  55                  60
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gga ggc tac atc aat ggg aca gca gaa gca gtg tat ggg cca ggt tgt      240
Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys
 65              70              75              80

ggt cta gct tgg gct cat gca ccc att gga tat tct ctg agt cta att      288
Gly Leu Ala Trp Ala His Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
                85              90              95

tta ggt ggt ctg ttt ttt gcg aaa cct atg cgt tcc aag gga tat gtg      336
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
            100             105             110

act atg tta gac cca ttc aaa cag atc tat gga aag cgc atg ggt ggg      384
Thr Met Leu Asp Pro Phe Lys Gln Ile Tyr Gly Lys Arg Met Gly Gly
            115             120             125

ctg ctc ttc atc cct gca ctg atg gga gag atg ttc tgg gct gca gca      432
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
            130             135             140

att ttc tct gca tta ggg gcc acc atc agc gtg atc att gat gtg gat      480
Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145             150             155             160

gtg aac ata tcg gtc att gtc tct gca ctc att gcc att ctt tat acc      528
Val Asn Ile Ser Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr
                165             170             175

cta gtg ggt ggg ctc tac tct gtg gca tat act gat gtt gtc cag cta      576
Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
            180             185             190

ttc tgc att ttt ata gga ctg tgg atc agt gtc cct ttt gcc ctg tca      624
Phe Cys Ile Phe Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
            195             200             205

cat cct gca gtc acc gac atc gga ttc aca gct gtg cat gct aaa tac      672
His Pro Ala Val Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
210             215             220

cag agt ccc tgg ctg gga acc att gaa tca gtt gaa gtc tac acc tgg      720
Gln Ser Pro Trp Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp
225             230             235             240

ctt gat aat ttt ctg tta ttg atg ctg ggt gga atc cca tgg caa gcc      768
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tac ttc cag agg gtc ctc tct tca tcc tca gcc acc tat gct cag gta      816
Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val
            260             265             270

ctg tcc ttc ctg gca gct ttt ggg tgc ctg gtg atg gct cta ccc gcc      864
Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Leu Pro Ala
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ata tgc ata gga gct att gga gct tcc aca gac tgg aac cag act gcc      912
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tac ggg tat cca gat ccc aag act aag gag gaa gca gac atg att ctc    960
Tyr Gly Tyr Pro Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu
305                 310               315               320

ccg atc gtt ctg cag tac ctc tgc cct gtg tac atc tcc ttc ttt ggg   1008
Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
                325               330               335

ctt ggt gct gtt tca gct gct gtc atg tcc tca gct gac tcg tcc atc   1056
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                340               345               350

ctg tcg gcg agt tct atg ttt gct cgg aat atc tac cag ctt tcc ttc   1104
Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe
            355               360               365

aga caa aat gca tca gac aag gaa att gtg tgg gtc atg agg atc act   1152
Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr
        370               375               380

gtg ctt gtg ttc gga gca tct gca aca gcc atg gct ttg ctg acg aag   1200
Val Leu Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
385               390               395               400

act gtg tat ggg ctc tgg tac ctg agc tct gac ctt gtc tac atc atc   1248
Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile
                405               410               415

atc ttc cca cag ctg ctc tgt gta ctc ttc atc aaa gga acc aac act   1296
Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr
            420               425               430

tat ggg gca gtt gct ggt tat att ttt gga cta ttc ctg aga att act   1344
Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr
            435               440               445

gga gga gag cca tat cta tac ttg cag ccc tta atc ttc tac cct ggt   1392
Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
        450               455               460

tat tac tct gac aag aat ggt ata tac aat cag agg ttc cca ttt aaa   1440
Tyr Tyr Ser Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys
465               470               475               480

act ctc tcc atg gtt acc tca ttc ttt acc aac att tgt gtt tct tat   1488
Thr Leu Ser Met Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr
                485               490               495

cta gcc aag tat cta ttt gaa agt gga acc ttg cct cca aaa tta gat   1536
Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
                500               505               510

gta ttt gat gct gtt gtc gca agg cac agt gaa gag aac atg gac aag   1584
Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
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acc att cta gtc aga aat gaa aat atc aaa tta aat gaa ctt gca cct    1632
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    530                    535                    540

gtg aaa cct cgg cag agc cta acc ctc agt tca act ttc acc aat aag    1680
Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys
545                    550                    555                560

gag gcc ctc ctt gat gtt gat tcc agt ccg gag ggg tct ggg act gaa    1728
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Asp Asn Leu Gln
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Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly
    50                  55                  60
Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys
65                  70                  75                  80
Gly Leu Ala Trp Ala His Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
                85                  90                  95
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
            100                 105                 110
Thr Met Leu Asp Pro Phe Lys Gln Ile Tyr Gly Lys Arg Met Gly Gly
        115                 120                 125
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
    130                 135                 140
Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145                 150                 155                 160
Val Asn Ile Ser Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr
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Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
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Phe Cys Ile Phe Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
        195                 200                 205
His Pro Ala Val Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
    210                 215                 220
Gln Ser Pro Trp Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp
225                 230                 235                 240
Leu Asp Asn Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala
                245                 250                 255
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Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val
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Ile Cys Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala
            290                 295             300
Tyr Gly Tyr Pro Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu
305                 310                 315             320
Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
                325             330                 335
Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile
            340                 345             350
Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe
            355                 360             365
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370                 375                 380
Val Leu Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
385                 390                 395             400
Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile
                405             410                 415
Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr
                420             425                 430
Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr
            435                 440             445
Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
    450                 455                 460
Tyr Tyr Ser Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys
465                 470                 475             480
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                485             490                 495
Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
            500                 505             510
Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
            515                 520             525
Thr Ile Leu Val Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro
    530                 535             540
Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys
545                 550                 555             560
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Asp Asn Leu Gln
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<222> (224)..(1966)

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gtagccctct gtggaaggat cttcacggta ccctaaataa aaa atg cct ttc cat 235
                                                Met Pro Phe His
                                                  1

gta gaa gga cta gta gcg att atc ctg ttc tac ctt ctt ata ttt ctg 283
Val Glu Gly Leu Val Ala Ile Ile Leu Phe Tyr Leu Leu Ile Phe Leu
  5   10   15   20

gtt gga ata tgg gct gca tgg aaa acc aaa aac agc ggt aat gca gaa 331
Val Gly Ile Trp Ala Ala Trp Lys Thr Lys Asn Ser Gly Asn Ala Glu
              25   30   35

gaa cgc agc gaa gcc atc ata gtt ggg ggc cga gac att ggt ttg ttg 379
Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp Ile Gly Leu Leu
          40   45   50

gtt ggt ggt ttt acc atg aca gcc acc tgg gtt gga gga ggt tac atc 427
Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly Gly Gly Tyr Ile
          55   60   65

aac ggg aca gct gaa gca gtt tat ggg cca ggt tgt ggt cta gct tgg 475
Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys Gly Leu Ala Trp
          70   75   80

gct cag gca ccc att gga tat tct ctg agt ctg att tta ggt ggc ctg 523
Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile Leu Gly Gly Leu
  85   90   95   100

ttt ttt gca aaa cct atg cgt tcc aag gga tat gtg act atg tta gac 571
Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val Thr Met Leu Asp
                  105   110   115

ccg ttt caa cag atc tat gga aag cgc atg ggt ggg ctg ctg ttc atc 619
Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly Leu Leu Phe Ile
              120   125   130

cct gca ctg atg gga gag atg ttc tgg gct gca gca att ttc tct gca 667
Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala Ile Phe Ser Ala
          135   140   145

tta ggg gct acc atc agc gta atc att gat gtg gat gtg aac ata tcg 715
Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp Val Asn Ile Ser
  150   155   160

gtc att gtc tcc gca ctc att gcc att ctt tat acc ctc gtg gga ggg 763
Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr Leu Val Gly Gly
165   170   175   180

ctc tac tct gtg gca tat act gat gtt gta cag cta ttc tgc att ttt 811
Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu Phe Cys Ile Phe
              185   190   195

ata gga ttg tgg atc agt gtc cca ttt gcc ctg tca cat cct gca gtc 859

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Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser His Pro Ala Val
            200             205                 210

acc gac att gga ttc act gct gtg cat gct aaa tac cag agt ccc tgg      907
Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr Gln Ser Pro Trp
            215             220                 225

ctg gga acc att gaa tca gtt gaa gtc tac acc tgg ctt gat aat ttt      955
Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp Leu Asp Asn Phe
        230             235                 240

ctg ttg ttg atg ctg ggt gga ata cca tgg caa gcc tac ttc cag agg     1003
Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala Tyr Phe Gln Arg
245             250                 255                 260

gtc ctc tct tca tcg tca gcg acc tat gct cag gtg ctg tcc ttc ctg     1051
Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val Leu Ser Phe Leu
                265                 270                 275

gca gct ttt ggg tgc ctg gtg atg gct cta cca gcc att tgc att ggg     1099
Ala Ala Phe Gly Cys Leu Val Met Ala Leu Pro Ala Ile Cys Ile Gly
            280                 285                 290

gcc att gga gcc tcc aca gac tgg aac caa act gca tat ggg ttt cca     1147
Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala Tyr Gly Phe Pro
        295                 300                 305

gat ccc aag acc aag gag gaa gca gac atg att ctc ccg att gtt cta     1195
Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu Pro Ile Val Leu
        310                 315                 320

cag tac ctc tgc cct gtg tac att tcc ttc ttt ggg ctt ggt gct gtt     1243
Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly Leu Gly Ala Val
325                 330                 335                 340

tct gct gct gtc atg tcc tcg gct gac tca tcc atc cta tca gca agt     1291
Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile Leu Ser Ala Ser
                345                 350                 355

tcc atg ttt gct cgg aat atc tac cag ctt tcc ttc aga caa aat gca     1339
Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe Arg Gln Asn Ala
            360                 365                 370

tca gac aag gaa att gtg tgg gtc atg agg atc act gtg ttt gtg ttt     1387
Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr Val Phe Val Phe
        375                 380                 385

gga gca tct gca aca gcc atg gcc ttg ctc acg aag act gtg tat ggg     1435
Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys Thr Val Tyr Gly
390                 395                 400

ctc tgg tac ctg agc tct gac ctt gtc tac atc atc atc ttc cca cag     1483
Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile Ile Phe Pro Gln
405                 410                 415                 420

ctg ctc tgt gta ctc ttc atc aaa gga acc aac act tat ggg gca gtt     1531
Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr Tyr Gly Ala Val
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gct ggt tat att ttt gga ctt ttc ctg aga att acc gga gga gag cca   1579
Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr Gly Gly Glu Pro
            440             445             450

tat cta tac ttg cag ccc tta atc ttc tac cct ggt tat tac cct gac   1627
Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly Tyr Tyr Pro Asp
            455             460             465

aag aat ggt ata tac aat cag agg ttc cca ttt aaa act ctc tcc atg   1675
Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys Thr Leu Ser Met
        470             475             480

gtt acc tca ttc ttt acc aac att tgt gtt tcc tat cta gcc aag tat   1723
Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr Leu Ala Lys Tyr
485             490             495             500

cta ttt gaa agt gga acc ttg cct cca aaa tta gat ata ttt gat gct   1771
Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp Ile Phe Asp Ala
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gtt gtc tca agg cac agt gaa gag aac atg gac aag acc att cta gtc   1819
Val Val Ser Arg His Ser Glu Glu Asn Met Asp Lys Thr Ile Leu Val
            520             525             530

aga aat gaa aac atc aaa tta aat gaa ctt gca cct gta aag cct cga   1867
Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro Val Lys Pro Arg
            535             540             545

cag agc cta acc ctc agt tca act ttc acc aat aaa gag gct ctc ctt   1915
Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys Glu Ala Leu Leu
    550             555             560

gat gtt gat tcc agt cca gag gga tct ggg act gaa gat aac tta caa   1963
Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu Asp Asn Leu Gln
565             570             575             580

tga ccccatgtaa aatatacaga acagggcatt gctgtagggt aatactggga        2016


aaaaggtttg gagcatatct tatacatgtt acaatataaa tgtttgagga aaaaagtttt 2076

tcagaaataa gatattatgg atgagttcag aaaaataaca attgcacagt gaggcagaag 2136

caagcgtgaa ggcaacagct ttatttctca tcgtagcact tttcattttg aatagctttg 2196

ttaagcacat aaaaatgcat aaagccccag ccaaagaaag tggccaaata ttatttatct 2256

ttattatgga aggaaggaat atttattaaa aagtccattg gaaggagatt ggatggtccc 2316

gatcattttc actggcgaat gcactggata acagattaat tactacaaca tggaggttat 2376

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atgggtaggt tgtctggctc tcccataatc ttaactatgg catttaccca tttttcaagg 2496
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atgacttaaa aattcctact gtgactttta aaatgtaaaa ttaaataatt ttacatattg 3636

taatgtccta tttttcagga ttgtctcaat ccttaaacca ctttactgat ttgtgtatgt 3696

acgtaaggaa gagaattcat ttaccctcca gtttatctca gaatcagctc actagctatg 3756

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acaatgaaat ttctggtaaa catggtattt cagatgcaca aagtcttcca acagagacaa 3936

aagagaaact tttgcccaac tcatgatctt ccatgaaatt gttgaggtgt ttgcttgcat 3996

taggaacatc acagaacctc actcacacta gatctcacag cgaagcaggt tcctttcaca 4056

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aatggaattc cccatgattt ccaagaaaga gatgatgctt caaggtatat tggattggag 4236
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acatctctaa attattccag attcaagcag cagacctcat tttcaaatcc ccaatgaaat 4296

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agcaagatag gagtttcact cctatatatt aacaatgatt gtgctatgtt tcttaggtaa 4416

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attttatct gtcaaaatgt tatacaaaat tatacagaaa taagtagatt tacaagtaca 4836

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                20                  25                  30
Gly Asn Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp
            35                  40                  45
Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly
        50                  55                  60
Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys
65                  70                  75                  80
Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
                85                  90                  95
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
               100                 105                 110
Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly
           115                 120                 125
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
       130                 135                 140
Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145                 150                 155                 160
Val Asn Ile Ser Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr
               165                 170                 175
Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
               180                 185                 190
Phe Cys Ile Phe Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
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                  195                        200                      205
    His Pro Ala Val Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
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    Gln Ser Pro Trp Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp
    225                        230                      235
    Leu Asp Asn Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala
                            245                      250
    Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val
                260                      265                      270
    Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Leu Pro Ala
                275                      280                      285
    Ile Cys Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala
        290                        295                      300
    Tyr Gly Phe Pro Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu
    305                        310                      315                320
    Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
                            325                      330                      335
    Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile
                340                      345                      350
    Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe
                355                      360                      365
    Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr
        370                        375                      380
    Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
    385                        390                      395                400
    Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile
                            405                      410                      415
    Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr
                420                      425                      430
    Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr
                435                      440                      445
    Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
        450                        455                      460
    Tyr Tyr Pro Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys
    465                        470                      475                480
    Thr Leu Ser Met Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr
                            485                      490                      495
    Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
                500                      505                      510
    Ile Phe Asp Ala Val Val Ser Arg His Ser Glu Glu Asn Met Asp Lys
                515                      520                      525
    Thr Ile Leu Val Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro
        530                        535                      540
    Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys
    545                        550                      555                560
    Glu Ala Leu Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu
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    Asp Asn Leu Gln
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gtg ctc att ctt gtc gtt gga ata tgg gcg ggt aga aaa tcg aaa agt   98
Val Leu Ile Leu Val Val Gly Ile Trp Ala Gly Arg Lys Ser Lys Ser
 15   20   25   30

tca aaa gag ctt gaa tca gaa gcc ggc gcg gcg acg gaa gag gtg atg   146
Ser Lys Glu Leu Glu Ser Glu Ala Gly Ala Ala Thr Glu Glu Val Met
            35   40   45

tta gct ggg aga aac atc gga act ctt gtc gga att ttc aca atg act   194
Leu Ala Gly Arg Asn Ile Gly Thr Leu Val Gly Ile Phe Thr Met Thr
          50   55   60

gcc acg tgg gtt ggc ggt gct tat atc aat gga acc gcc gag gct ctg   242
Ala Thr Trp Val Gly Gly Ala Tyr Ile Asn Gly Thr Ala Glu Ala Leu
      65   70   75

tat aat gga ggt ctc ctt gga tgt cag gct cca gtt gga tat gca att   290
Tyr Asn Gly Gly Leu Leu Gly Cys Gln Ala Pro Val Gly Tyr Ala Ile
     80   85   90

tcc ctt gtt atg gga gga cta ctt ttc gca aag aaa atg cga gaa gaa   338
Ser Leu Val Met Gly Gly Leu Leu Phe Ala Lys Lys Met Arg Glu Glu
 95   100   105   110

gga tat att aca atg ctc gat cct ttt cag cac aaa tat ggc caa cga   386
Gly Tyr Ile Thr Met Leu Asp Pro Phe Gln His Lys Tyr Gly Gln Arg
            115   120   125

atc ggt ggc ttg atg tat gtt cca gca ctt ctt ggt gaa aca ttc tgg   434
Ile Gly Gly Leu Met Tyr Val Pro Ala Leu Leu Gly Glu Thr Phe Trp
          130   135   140

aca gca gcc att ctt tcg gca ctt ggt gca aca ctg tcg gta att ctt   482
Thr Ala Ala Ile Leu Ser Ala Leu Gly Ala Thr Leu Ser Val Ile Leu
        145   150   155

gga atc gac atg aat gca tca gtg acc ctg tcg gcc tgt att gcc gta   530
Gly Ile Asp Met Asn Ala Ser Val Thr Leu Ser Ala Cys Ile Ala Val
 160   165   170

ttc tac aca ttc acc ggt gga tac tat gca gtc gcg tac act gac gtc   578
Phe Tyr Thr Phe Thr Gly Gly Tyr Tyr Ala Val Ala Tyr Thr Asp Val
175   180   185   190

gtt caa cta ttt tgc att ttc gtc ggt ttg tgg gtt tgc gtg ccg gcg   626
Val Gln Leu Phe Cys Ile Phe Val Gly Leu Trp Val Cys Val Pro Ala
      195   200   205

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gct atg gtg cat gat ggt gcg aag gat att tcc agg aat gca ggc gac    674
Ala Met Val His Asp Gly Ala Lys Asp Ile Ser Arg Asn Ala Gly Asp
            210             215             220

tgg att gga gag att gga gga ttc aaa gaa aca tct ctc tgg att gat    722
Trp Ile Gly Glu Ile Gly Gly Phe Lys Glu Thr Ser Leu Trp Ile Asp
            225             230             235

tgc atg ctt ctc ctt gtc ttt gga gga att cca tgg caa gtg tac ttc    770
Cys Met Leu Leu Leu Val Phe Gly Gly Ile Pro Trp Gln Val Tyr Phe
    240             245             250

caa aga gtt ctc tcc tca aaa act gct cat gga gca cag acg ttg tcg    818
Gln Arg Val Leu Ser Ser Lys Thr Ala His Gly Ala Gln Thr Leu Ser
255             260             265             270

ttt gtg gcg ggc gtc gga tgc att ctc atg gcg att cca cca gcg ttg    866
Phe Val Ala Gly Val Gly Cys Ile Leu Met Ala Ile Pro Pro Ala Leu
            275             280             285

atc ggt gca att gcc agg aac aca gac tgg aga atg act gat tat tcc    914
Ile Gly Ala Ile Ala Arg Asn Thr Asp Trp Arg Met Thr Asp Tyr Ser
            290             295             300

cca tgg aac aat gga act aag gtc gaa tcg att cca ccg gat aag aga    962
Pro Trp Asn Asn Gly Thr Lys Val Glu Ser Ile Pro Pro Asp Lys Arg
        305             310             315

aac atg gtg gtc ccg ttg gta ttc cag tat ctt acg cca aga tgg gtc    1010
Asn Met Val Val Pro Leu Val Phe Gln Tyr Leu Thr Pro Arg Trp Val
    320             325             330

gcc ttt att gga ctc ggc gca gtg tcg gct gct gta atg tca tct gca    1058
Ala Phe Ile Gly Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala
335             340             345             350

gat tca tct gta cta tca gca gca tca atg ttt gct cac aac atc tgg    1106
Asp Ser Ser Val Leu Ser Ala Ala Ser Met Phe Ala His Asn Ile Trp
            355             360             365

aag ctc aca att cgc cct cac gcg tct gaa aaa gaa gtg ata att gtg    1154
Lys Leu Thr Ile Arg Pro His Ala Ser Glu Lys Glu Val Ile Ile Val
            370             375             380

atg aga ata gcc atc atc tgt gtt ggt atc atg gca acc atc atg gca    1202
Met Arg Ile Ala Ile Ile Cys Val Gly Ile Met Ala Thr Ile Met Ala
            385             390             395

ctt acc att caa tcc atc tat ggg ctt tgg tat ctt tgt gca gat ttg    1250
Leu Thr Ile Gln Ser Ile Tyr Gly Leu Trp Tyr Leu Cys Ala Asp Leu
    400             405             410

gtc tac gtc ata ctc ttc cct caa cta tta tgt gtt gta tat atg cca    1298
Val Tyr Val Ile Leu Phe Pro Gln Leu Leu Cys Val Val Tyr Met Pro
415             420             425             430

cgt agc aat acg tat ggc tca ttg gct ggc tat gca gtc ggt ctt gtg    1346
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          Arg Ser Asn Thr Tyr Gly Ser Leu Ala Gly Tyr Ala Val Gly Leu Val
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          ctc cgt ttg att gga ggc gag cca ctt gta tcg ctg cca gcg ttc ttc   1394
          Leu Arg Leu Ile Gly Gly Glu Pro Leu Val Ser Leu Pro Ala Phe Phe
                      450                 455                 460

          cat tat cca atg tat acg gat ggg gta cag tat ttc cca ttc agg aca   1442
          His Tyr Pro Met Tyr Thr Asp Gly Val Gln Tyr Phe Pro Phe Arg Thr
                      465                 470                 475

          act gct atg tta tct tca atg gct act atc tac att gta tca ata caa   1490
          Thr Ala Met Leu Ser Ser Met Ala Thr Ile Tyr Ile Val Ser Ile Gln
                      480                 485                 490

          tcg gag aag ctg ttc aaa tcg gga cgt ttg tct ccg gag tgg gac gta   1538
          Ser Glu Lys Leu Phe Lys Ser Gly Arg Leu Ser Pro Glu Trp Asp Val
          495                 500                 505                 510

          atg ggt tgt gta gtg aat att ccg ata gat cat gta ccc ctt ccg tca   1586
          Met Gly Cys Val Val Asn Ile Pro Ile Asp His Val Pro Leu Pro Ser
                      515                 520                 525

          gat gta tcg ttt gct gtt agt agt gag acc ttg aat atg aag gct cca   1634
          Asp Val Ser Phe Ala Val Ser Ser Glu Thr Leu Asn Met Lys Ala Pro
                      530                 535                 540

          aac gga aca ccg gct cca gta cat ccg aac caa cag ccg tct gat gaa   1682
          Asn Gly Thr Pro Ala Pro Val His Pro Asn Gln Gln Pro Ser Asp Glu
                      545                 550                 555

          aat aca tta tta cat cca tat tcg gac caa agt tat tat tcc aca aat   1730
          Asn Thr Leu Leu His Pro Tyr Ser Asp Gln Ser Tyr Tyr Ser Thr Asn
                      560                 565                 570

          agc aat taa aagagacgaa cttgttccac gtgttcactt aatttcctcc        1779
          Ser Asn
          575

          caaatttttt tttgtatttt ttttagtttt cgttaacttt tttctcactt tctcaaattt 1839

          cagatctcta ttaatagacc catccggtgg atacacttta gtttttattt attttcctaa 1899

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          <213> Caenorhabditis elegans

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Glu Leu Glu Ser Glu Ala Gly Ala Ala Thr Glu Glu Val Met Leu Ala
        35                      40                      45
Gly Arg Asn Ile Gly Thr Leu Val Gly Ile Phe Thr Met Thr Ala Thr
    50                      55                      60
Trp Val Gly Gly Ala Tyr Ile Asn Gly Thr Ala Glu Ala Leu Tyr Asn
65                      70                      75                      80
Gly Gly Leu Leu Gly Cys Gln Ala Pro Val Gly Tyr Ala Ile Ser Leu
                    85                      90                      95
Val Met Gly Gly Leu Leu Phe Ala Lys Lys Met Arg Glu Glu Gly Tyr
                    100                     105                     110
Ile Thr Met Leu Asp Pro Phe Gln His Lys Tyr Gly Gln Arg Ile Gly
                    115                     120                     125
Gly Leu Met Tyr Val Pro Ala Leu Leu Gly Glu Thr Phe Trp Thr Ala
    130                     135                     140
Ala Ile Leu Ser Ala Leu Gly Ala Thr Leu Ser Val Ile Leu Gly Ile
145                     150                     155                     160
Asp Met Asn Ala Ser Val Thr Leu Ser Ala Cys Ile Ala Val Phe Tyr
                    165                     170                     175
Thr Phe Thr Gly Gly Tyr Tyr Ala Val Ala Tyr Thr Asp Val Val Gln
                    180                     185                     190
Leu Phe Cys Ile Phe Val Gly Leu Trp Val Cys Val Pro Ala Ala Met
                    195                     200                     205
Val His Asp Gly Ala Lys Asp Ile Ser Arg Asn Ala Gly Asp Trp Ile
    210                     215                     220
Gly Glu Ile Gly Gly Phe Lys Glu Thr Ser Leu Trp Ile Asp Cys Met
225                     230                     235                     240
Leu Leu Leu Val Phe Gly Gly Ile Pro Trp Gln Val Tyr Phe Gln Arg
                    245                     250                     255
Val Leu Ser Ser Lys Thr Ala His Gly Ala Gln Thr Leu Ser Phe Val
                    260                     265                     270
Ala Gly Val Gly Cys Ile Leu Met Ala Ile Pro Pro Ala Leu Ile Gly
                    275                     280                     285
Ala Ile Ala Arg Asn Thr Asp Trp Arg Met Thr Asp Tyr Ser Pro Trp
    290                     295                     300
Asn Asn Gly Thr Lys Val Glu Ser Ile Pro Pro Asp Lys Arg Asn Met
305                     310                     315                     320
Val Val Pro Leu Val Phe Gln Tyr Leu Thr Pro Arg Trp Val Ala Phe
                    325                     330                     335
Ile Gly Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser
                    340                     345                     350
Ser Val Leu Ser Ala Ala Ser Met Phe Ala His Asn Ile Trp Lys Leu
                    355                     360                     365
Thr Ile Arg Pro His Ala Ser Glu Lys Glu Val Ile Ile Val Met Arg
    370                     375                     380
Ile Ala Ile Ile Cys Val Gly Ile Met Ala Thr Ile Met Ala Leu Thr
385                     390                     395                     400
Ile Gln Ser Ile Tyr Gly Leu Trp Tyr Leu Cys Ala Asp Leu Val Tyr
                    405                     410                     415
Val Ile Leu Phe Pro Gln Leu Leu Cys Val Val Tyr Met Pro Arg Ser
                    420                     425                     430
Asn Thr Tyr Gly Ser Leu Ala Gly Tyr Ala Val Gly Leu Val Leu Arg
                    435                     440                     445
Leu Ile Gly Gly Glu Pro Leu Val Ser Leu Pro Ala Phe Phe His Tyr
    450                     455                     460
Pro Met Tyr Thr Asp Gly Val Gln Tyr Phe Pro Phe Arg Thr Thr Ala
465                     470                     475                     480
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    Met Leu Ser Ser Met Ala Thr Ile Tyr Ile Val Ser Ile Gln Ser Glu
                     485                 490                 495
    Lys Leu Phe Lys Ser Gly Arg Leu Ser Pro Glu Trp Asp Val Met Gly
                 500                 505                 510
    Cys Val Val Asn Ile Pro Ile Asp His Val Pro Leu Pro Ser Asp Val
                 515                 520                 525
    Ser Phe Ala Val Ser Ser Glu Thr Leu Asn Met Lys Ala Pro Asn Gly
             530                 535                 540
    Thr Pro Ala Pro Val His Pro Asn Gln Gln Pro Ser Asp Glu Asn Thr
    545                 550                 555                 560
    Leu Leu His Pro Tyr Ser Asp Gln Ser Tyr Tyr Ser Thr Asn Ser Asn
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<210> 9
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<212> DNA
<213> Homo sapiens

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                      Met Ala Phe His Val Glu Gly Leu Ile Ala Ile
                       1               5                      10

atc gtg ttc tac ctt cta att ttg ctg gtt gga ata tgg gct gcc tgg    99
Ile Val Phe Tyr Leu Leu Ile Leu Leu Val Gly Ile Trp Ala Ala Trp
             15                  20                  25

aga acc aaa aac agt ggc agc gca gaa gag cgc agc gaa gcc atc ata   147
Arg Thr Lys Asn Ser Gly Ser Ala Glu Glu Arg Ser Glu Ala Ile Ile
         30                  35                  40

gtt ggt ggc cga gat att ggt tta ttg gtt ggt gga ttt acc atg aca   195
Val Gly Gly Arg Asp Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr
         45                  50                  55

gct acc tgg gtc gga gga ggg tat atc aat ggc aca gct gaa gca gtt   243
Ala Thr Trp Val Gly Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val
 60                  65                  70                  75

tat gta cca ggt tat ggc cta gct tgg gct cag gca cca att gga tat   291
Tyr Val Pro Gly Tyr Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr
                 80                  85                  90

tct ctt agt ctg att tta ggt ggc ctg ttc ttt gca aaa cct atg cgt   339
Ser Leu Ser Leu Ile Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg
                 95                 100                 105

tca aag ggg tat gtg acc atg tta gac ccg ttt cag caa atc tat gga   387
Ser Lys Gly Tyr Val Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly
         110                 115                 120
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aaa cgc atg ggc gga ctc ctg ttt att cct gca ctg atg gga gaa atg      435
Lys Arg Met Gly Gly Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met
    125             130             135

ttc tgg gct gca gca att ttc tct gct ttg gga gcc acc atc agc gtg      483
Phe Trp Ala Ala Ala Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val
140             145             150             155

atc atc gat gtg gat atg cac att tct gtc atc atc tct gca ctc att      531
Ile Ile Asp Val Asp Met His Ile Ser Val Ile Ile Ser Ala Leu Ile
            160             165             170

gcc act ctg tac aca ctg gtg gga ggg ctc tat tct gtg gcc tac act      579
Ala Thr Leu Tyr Thr Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr
            175             180             185

gat gtc gtt cag ctc ttt tgc att ttt gta ggg ctg tgg atc agc gtc      627
Asp Val Val Gln Leu Phe Cys Ile Phe Val Gly Leu Trp Ile Ser Val
            190             195             200

ccc ttt gca ttg tca cat cct gca gtc gca gac atc ggg ttc act gct      675
Pro Phe Ala Leu Ser His Pro Ala Val Ala Asp Ile Gly Phe Thr Ala
    205             210             215

gtg cat gcc aaa tac caa aag ccg tgg ctg gga act gtt gac tca tct      723
Val His Ala Lys Tyr Gln Lys Pro Trp Leu Gly Thr Val Asp Ser Ser
220             225             230             235

gaa gtc tac tct tgg ctt gat agt ttt ctg ttg ttg atg ctg ggt gga      771
Glu Val Tyr Ser Trp Leu Asp Ser Phe Leu Leu Leu Met Leu Gly Gly
            240             245             250

atc cca tgg caa gca tac ttt cag agg gtt ctc tct tct tcc tca gcc      819
Ile Pro Trp Gln Ala Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala
            255             260             265

acc tat gct caa gtg ctg tcc ttc ctg gca gct ttc ggg tgc ctg gtg      867
Thr Tyr Ala Gln Val Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val
            270             275             280

atg gcc atc cca gcc ata ctc att ggg gcc att gga gca tca aca gac      915
Met Ala Ile Pro Ala Ile Leu Ile Gly Ala Ile Gly Ala Ser Thr Asp
    285             290             295

tgg aac cag act gca tat ggg ctt cca gat ccc aag act aca gaa gag      963
Trp Asn Gln Thr Ala Tyr Gly Leu Pro Asp Pro Lys Thr Thr Glu Glu
300             305             310             315

gca gac atg att tta cca att gtt ctg cag tat ctc tgc cct gtg tat     1011
Ala Asp Met Ile Leu Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr
            320             325             330

att tct ttc ttt ggt ctt ggt gca gtt tct gct gct gtt atg tca tca     1059
Ile Ser Phe Phe Gly Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser
            335             340             345

gca gat tct tcc atc ttg tca gca agt tcc atg ttt gca cgg aac atc     1107
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Ala Asp Ser Ser Ile Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile
        350             355             360

tac cag ctt tcc ttc aga caa aat gct tcg gac aaa gaa atc gtt tgg    1155
Tyr Gln Leu Ser Phe Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp
        365             370             375

gtt atg cga atc aca gtg ttt gtg ttt gga gca tct gca aca gcc atg    1203
Val Met Arg Ile Thr Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met
380             385             390             395

gcc ttg ctg acg aaa act gtg tat ggg ctc tgg tac ctc agt tct gac    1251
Ala Leu Leu Thr Lys Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp
            400             405             410

ctt gtt tac atc gtt atc ttc ccc cag ctg ctt tgt gta ctc ttt gtt    1299
Leu Val Tyr Ile Val Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Val
            415             420             425

aag gga acc aac acc tat ggg gcc gtg gca ggt tat gtt tct ggc ctc    1347
Lys Gly Thr Asn Thr Tyr Gly Ala Val Ala Gly Tyr Val Ser Gly Leu
            430             435             440

ttc ctg aga ata act gga ggg gag cca tat ctg tat ctt cag ccc ttg    1395
Phe Leu Arg Ile Thr Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu
            445             450             455

atc ttc tac cct ggc tat tac cct gat gat aat ggt ata tat aat cag    1443
Ile Phe Tyr Pro Gly Tyr Tyr Pro Asp Asp Asn Gly Ile Tyr Asn Gln
460             465             470             475

aaa ttt cca ttt aaa aca ctt gcc atg gtt aca tca ttc tta acc aac    1491
Lys Phe Pro Phe Lys Thr Leu Ala Met Val Thr Ser Phe Leu Thr Asn
            480             485             490

att tgc atc tcc tat cta gcc aag tat cta ttt gaa agt gga acc ttg    1539
Ile Cys Ile Ser Tyr Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu
            495             500             505

cca cct aaa tta gat gta ttt gat gct gtt gtt gca aga cac agt gaa    1587
Pro Pro Lys Leu Asp Val Phe Asp Ala Val Val Ala Arg His Ser Glu
            510             515             520

gaa aac atg gat aag aca att ctt gtc aaa aat gaa aat att aaa tta    1635
Glu Asn Met Asp Lys Thr Ile Leu Val Lys Asn Glu Asn Ile Lys Leu
            525             530             535

gat gaa ctt gca ctt gtg aag cca cga cag agc atg acc ctc agc tca    1683
Asp Glu Leu Ala Leu Val Lys Pro Arg Gln Ser Met Thr Leu Ser Ser
540             545             550             555

act ttc acc aat aaa gag gcc ttc ctt gat gtt gat tcc agt cca gaa    1731
Thr Phe Thr Asn Lys Glu Ala Phe Leu Asp Val Asp Ser Ser Pro Glu
            560             565             570

ggg tct ggg act gaa gat aat tta cag tga ccccatctaa ataaaatact     1781
Gly Ser Gly Thr Glu Asp Asn Leu Gln
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gcttttgcaa acagaacact gtaatagggt ag   1813

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<212> PRT
<213> Homo sapiens

<400> 10

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Leu Ile Leu Leu Val Gly Ile Trp Ala Ala Trp Arg Thr Lys Asn Ser
20   25   30

Gly Ser Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp
        35   40   45

Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly
    50   55   60

Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Val Pro Gly Tyr
65   70   75   80

Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
                85   90   95

Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
            100   105   110

Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly
            115   120   125

Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
    130   135   140

Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145   150   155   160

Met His Ile Ser Val Ile Ile Ser Ala Leu Ile Ala Thr Leu Tyr Thr
                165   170   175

Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
            180   185   190

Phe Cys Ile Phe Val Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
        195   200   205

His Pro Ala Val Ala Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
210   215   220

Gln Lys Pro Trp Leu Gly Thr Val Asp Ser Ser Glu Val Tyr Ser Trp
225   230   235   240

Leu Asp Ser Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala
                245   250   255

Tyr Phe Gln Arg Val Leu Ser Ser Ser Ala Thr Tyr Ala Gln Val
            260   265   270

Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Ile Pro Ala
            275   280   285

Ile Leu Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala
    290   295   300

Tyr Gly Leu Pro Asp Pro Lys Thr Thr Glu Glu Ala Asp Met Ile Leu
305   310   315   320

Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
                325   330   335

Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile
            340   345   350

Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe
    355   360   365

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Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr
    370             375             380
Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
385             390             395             400
Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Val
            405             410             415
Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Val Lys Gly Thr Asn Thr
            420             425             430
Tyr Gly Ala Val Ala Gly Tyr Val Ser Gly Leu Phe Leu Arg Ile Thr
    435             440             445
Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
    450             455             460
Tyr Tyr Pro Asp Asp Asn Gly Ile Tyr Asn Gln Lys Phe Pro Phe Lys
465             470             475             480
Thr Leu Ala Met Val Thr Ser Phe Leu Thr Asn Ile Cys Ile Ser Tyr
            485             490             495
Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
    500             505             510
Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
    515             520             525
Thr Ile Leu Val Lys Asn Glu Asn Ile Lys Leu Asp Glu Leu Ala Leu
    530             535             540
Val Lys Pro Arg Gln Ser Met Thr Leu Ser Ser Thr Phe Thr Asn Lys
545             550             555             560
Glu Ala Phe Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu
            565             570             575
Asp Asn Leu Gln
        580


<210> 11
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<212> PRT
<213> Homo sapiens

<400> 11
Met Ala Phe His Val Glu Gly Leu Ile Ala Ile Ile Val Phe Tyr Leu
    1           5               10              15

Leu Ile Leu Leu Val Gly Ile Trp Ala Ala Trp Arg Thr Lys Asn Ser
            20              25              30

Gly Ser Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp
            35              40              45

Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly
    50              55              60

Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Val Pro Gly Tyr
65              70              75              80

Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
            85              90              95

Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
            100             105             110
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```
Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly
    115                 120             125
    
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
    130             135             140

Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145             150             155             160

Met His Ile Ser Val Ile Ile Ser Ala Leu Ile Ala Thr Leu Tyr Thr
                165             170             175

Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
            180             185             190

Phe Cys Ile Phe Val Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
        195             200             205

His Pro Ala Val Ala Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
    210             215             220

Gln Lys Pro Trp Leu Gly Thr Val Asp Ser Ser Glu Val Tyr Ser Trp
225             230             235             240

Leu Asp Ser Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala
            245             250             255

Tyr Phe Gln Arg Val Leu Ser Ser Ser Ala Thr Tyr Ala Gln Val
        260             265             270

Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Ile Pro Ala
        275             280             285

Ile Leu Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala
    290             295             300

Tyr Gly Leu Pro Asp Pro Lys Thr Thr Glu Glu Ala Asp Met Ile Leu
305             310             315             320

Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
            325             330             335

Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile
            340             345             350

Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe
        355             360             365

Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr
    370             375             380

Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
385             390             395             400

Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Val
            405             410             415
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Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Val Lys Gly Thr Asn Thr
            420             425             430

Tyr Gly Ala Val Ala Gly Tyr Val Ser Gly Leu Phe Leu Arg Ile Thr
            435             440             445

Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
        450             455             460

Tyr Tyr Pro Asp Asp Asn Gly Ile Tyr Asn Gln Lys Phe Pro Phe Lys
465             470             475             480

Thr Leu Ala Met Val Thr Ser Phe Leu Thr Asn Ile Cys Ile Ser Tyr
                485             490             495

Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
            500             505             510

Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
            515             520             525

Thr Ile Leu Val Lys Asn Glu Asn Ile Lys Leu Asp Glu Leu Ala Leu
        530             535             540

Val Lys Pro Arg Gln Ser Met Thr Leu Ser Ser Thr Phe Thr Asn Lys
545             550             555             560

Glu Ala Phe Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu
            565             570             575

Asp Asn Leu Gln
            580


<210> 12
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<212> PRT
<213> Homo sapiens

<400> 12
Met Ala Phe His Val Glu Gly Leu Ile Ala Ile Ile Val Phe Tyr Leu
    1               5               10              15

Leu Ile Leu Leu Val Gly Ile Trp Ala Ala Trp Arg Thr Lys Asn Ser
            20              25              30

Gly Ser Ala Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp
        35              40              45

Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly
        50              55              60

Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Val Pro Gly Tyr
65              70              75              80

Gly Leu Ala Trp Ala Gln Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
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                85                    90                    95
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
            100                 105                 110

Thr Met Leu Asp Pro Phe Gln Gln Ile Tyr Gly Lys Arg Met Gly Gly
            115                 120                 125

Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
        130                 135                 140

Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145                 150                 155                 160

Met His Ile Ser Val Ile Ile Ser Ala Leu Ile Ala Thr Leu Tyr Thr
                165                 170                 175

Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
            180                 185                 190

Phe Cys Ile Phe Val Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
        195                 200                 205

His Pro Ala Val Ala Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
    210                 215                 220

Gln Lys Pro Trp Leu Gly Thr Val Asp Ser Ser Glu Val Tyr Ser Trp
225                 230                 235                 240

Leu Asp Ser Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala
                245                 250                 255

Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val
            260                 265                 270

Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Ile Pro Ala
        275                 280                 285

Ile Leu Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala
    290                 295                 300

Tyr Gly Leu Pro Asp Pro Lys Thr Thr Glu Glu Ala Asp Met Ile Leu
305                 310                 315                 320

Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
            325                 330                 335

Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile
            340                 345                 350

Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe
        355                 360                 365

Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr
    370                 375                 380

Val Phe Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
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```
385                    390                    395                    400

Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Val
            405             410                 415

Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Val Lys Gly Thr Asn Thr
            420             425             430

Tyr Gly Ala Val Ala Gly Tyr Val Ser Gly Leu Phe Leu Arg Ile Thr
        435             440                 445

Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
    450             455             460

Tyr Tyr Pro Asp Asp Asn Gly Ile Tyr Asn Gln Lys Phe Pro Phe Lys
465             470                 475                 480

Thr Leu Ala Met Val Thr Ser Phe Leu Thr Asn Ile Cys Ile Ser Tyr
            485             490                 495

Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
        500             505             510

Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
    515             520             525

Thr Ile Leu Val Lys Asn Glu Asn Ile Lys Leu Asp Glu Leu Ala Leu
    530             535             540

Val Lys Pro Arg Gln Ser Met Thr Leu Ser Ser Thr Phe Thr Asn Lys
545             550             555             560

Glu Ala Phe Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu
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Asp Asn Leu Gln
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<212> DNA
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<223> N = A, C, G or T/U

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aaagaagaaa tttcaagaaa aattttaaaa gattttgaag taaaagaaaa tgagaacaca     180
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gcttgtcaaa  atttgtgaga  tgcagcaaaa  gcagtgctta  taagaaaatc  tatatcactg   240
aatgcatgta  cagtcatgta  taacaatgac  ggggatacat  tgtgagaaat  gcatctttag   300
gtaattttgt  gtgaatgtta  tagaatgtat  cttcacaaac  ttatatggtc  tagcctacta   360
aacacctaag  ctatatagtt  cagtctattg  ctcctatgct  acaaacctac  acagcatatt   420
gctgagctga  atactgtagg  caattgtaac  acagtggttg  gtatttgtgt  atctaagcat   480
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aaactcacac  aagaagaagt  aaacaatctt  attaggatta  tatctattaa  agaaattcag  1020
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            420             425             430

tat ggg gca gtt gct ggt tat att ttt gga cta ttc ctg aga att act    1344
Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr
            435             440             445

gga gga gag cca tat cta tac ttg cag ccc tta atc ttc tac cct ggt    1392
Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
    450             455             460

tat tac tct gac aag aat ggt ata tac aat cag agg ttc cca ttt aaa    1440
Tyr Tyr Ser Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys
465             470             475             480

act ctc tcc atg gtt acc tca ttc ttt acc aac att tgt gtt tct tat    1488
Thr Leu Ser Met Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr
            485             490             495

cta gcc aag tat cta ttt gaa agt gga acc ttg cct cca aaa tta gat    1536
Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
            500             505             510

gta ttt gat gct gtt gtc gca agg cac agt gaa gag aac atg gac aag    1584
Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
            515             520             525

acc att cta gtc aga aat gaa aat atc aaa tta aat gaa ctt gca cct    1632
Thr Ile Leu Val Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro
    530             535             540

gtg aaa cct cgg cag agc cta acc ctc agt tca act ttc acc aat aag    1680
Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys
545             550             555             560

gag gcc ctc ctt gat gtt gat tcc agt ccg gag ggg tct ggg act gaa    1728
Glu Ala Leu Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu
            565             570             575

gat aat tta caa tga                                                1743
Asp Asn Leu Gln
            580
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<211> 580
<212> PRT
<213> Mus musculus

<400> 24
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Met Pro Phe His Val Glu Gly Leu Val Ala Ile Ile Leu Phe Tyr Leu
1               5                   10                  15
Leu Ile Phe Leu Val Gly Ile Trp Ala Ala Trp Lys Thr Lys Asn Ser
            20                  25                  30
Gly Asn Pro Glu Glu Arg Ser Glu Ala Ile Ile Val Gly Gly Arg Asp
        35                  40                  45
Ile Gly Leu Leu Val Gly Gly Phe Thr Met Thr Ala Thr Trp Val Gly
    50                  55                  60
Gly Gly Tyr Ile Asn Gly Thr Ala Glu Ala Val Tyr Gly Pro Gly Cys
65                  70                  75                  80
Gly Leu Ala Trp Ala His Ala Pro Ile Gly Tyr Ser Leu Ser Leu Ile
                85                  90                  95
Leu Gly Gly Leu Phe Phe Ala Lys Pro Met Arg Ser Lys Gly Tyr Val
            100                 105                 110
Thr Met Leu Asp Pro Phe Lys Gln Ile Tyr Gly Lys Arg Met Gly Gly
        115                 120                 125
Leu Leu Phe Ile Pro Ala Leu Met Gly Glu Met Phe Trp Ala Ala Ala
    130                 135                 140
Ile Phe Ser Ala Leu Gly Ala Thr Ile Ser Val Ile Ile Asp Val Asp
145                 150                 155                 160
Val Asn Ile Ser Val Ile Val Ser Ala Leu Ile Ala Ile Leu Tyr Thr
                165                 170                 175
Leu Val Gly Gly Leu Tyr Ser Val Ala Tyr Thr Asp Val Val Gln Leu
            180                 185                 190
Phe Cys Ile Phe Ile Gly Leu Trp Ile Ser Val Pro Phe Ala Leu Ser
        195                 200                 205
His Pro Ala Val Thr Asp Ile Gly Phe Thr Ala Val His Ala Lys Tyr
    210                 215                 220
Gln Ser Pro Trp Leu Gly Thr Ile Glu Ser Val Glu Val Tyr Thr Trp
225                 230                 235                 240
Leu Asp Asn Phe Leu Leu Leu Met Leu Gly Gly Ile Pro Trp Gln Ala
                245                 250                 255
Tyr Phe Gln Arg Val Leu Ser Ser Ser Ser Ala Thr Tyr Ala Gln Val
            260                 265                 270
Leu Ser Phe Leu Ala Ala Phe Gly Cys Leu Val Met Ala Leu Pro Ala
        275                 280                 285
Ile Cys Ile Gly Ala Ile Gly Ala Ser Thr Asp Trp Asn Gln Thr Ala
    290                 295                 300
Tyr Gly Tyr Pro Asp Pro Lys Thr Lys Glu Glu Ala Asp Met Ile Leu
305                 310                 315                 320
Pro Ile Val Leu Gln Tyr Leu Cys Pro Val Tyr Ile Ser Phe Phe Gly
            325                 330                 335
Leu Gly Ala Val Ser Ala Ala Val Met Ser Ser Ala Asp Ser Ser Ile
        340                 345                 350
Leu Ser Ala Ser Ser Met Phe Ala Arg Asn Ile Tyr Gln Leu Ser Phe
    355                 360                 365
Arg Gln Asn Ala Ser Asp Lys Glu Ile Val Trp Val Met Arg Ile Thr
    370                 375                 380
Val Leu Val Phe Gly Ala Ser Ala Thr Ala Met Ala Leu Leu Thr Lys
385                 390                 395                 400
Thr Val Tyr Gly Leu Trp Tyr Leu Ser Ser Asp Leu Val Tyr Ile Ile
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                    405                      410                         415
Ile Phe Pro Gln Leu Leu Cys Val Leu Phe Ile Lys Gly Thr Asn Thr
            420                     425                     430
Tyr Gly Ala Val Ala Gly Tyr Ile Phe Gly Leu Phe Leu Arg Ile Thr
        435                     440                 445
Gly Gly Glu Pro Tyr Leu Tyr Leu Gln Pro Leu Ile Phe Tyr Pro Gly
    450                     455                 460
Tyr Tyr Ser Asp Lys Asn Gly Ile Tyr Asn Gln Arg Phe Pro Phe Lys
465                     470                 475                     480
Thr Leu Ser Met Val Thr Ser Phe Phe Thr Asn Ile Cys Val Ser Tyr
                485                     490                     495
Leu Ala Lys Tyr Leu Phe Glu Ser Gly Thr Leu Pro Pro Lys Leu Asp
            500                     505                 510
Val Phe Asp Ala Val Val Ala Arg His Ser Glu Glu Asn Met Asp Lys
        515                     520                 525
Thr Ile Leu Val Arg Asn Glu Asn Ile Lys Leu Asn Glu Leu Ala Pro
    530                     535                 540
Val Lys Pro Arg Gln Ser Leu Thr Leu Ser Ser Thr Phe Thr Asn Lys
545                     550                 555                     560
Glu Ala Leu Leu Asp Val Asp Ser Ser Pro Glu Gly Ser Gly Thr Glu
                565                     570                     575
Asp Asn Leu Gln
            580



<210> 25
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<212> PRT
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<220>
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      Peptide

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  1                 5                   10                  15


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<212> DNA
<213> Artificial Sequence

<220>
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<210> 27
<211> 35
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic
      Primer

<400> 27
gactcgaggt cacttgtaaa gttatcttca gtccc   35